

Quick Start Guide

Learn how to use your new DJI Phantom 4 Pro drone with
DroneDeploy mapping software

Introduction

In this guide, you'll learn how to use your new DJI Phantom 4 Pro drone with DroneDeploy mapping software to help you gain timely insights about your fields.

With broad compatibility across multiple devices and with common farm software, it's easy to integrate aerial data into your existing workflow to make better decisions around the farm.

Here are just a few ways growers are using drone mapping throughout the year:



Stand and
plant counting



Variable rate
prescriptions



Efficient
crop scouting



Crop damage
assessment



Disease and
pest detection



Drainage and
irrigation planning

As a DroneDeploy user, you'll also gain access to specialized tools from industry experts, many of which are free, that can be installed from the App Market and used directly within the DroneDeploy interface.



Now that you have your drone, follow this easy, step-by-step approach to start flying, capturing and analyzing aerial data of your farm. You can also watch our Zero to Hero video guide at support.dronedeploy.com/docs/onboarding-with-dronedeploy.

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1 – Initial Setup

Unbox and Assemble Your Drone

Follow the instructions in the Phantom 4 Pro manual to set up your drone.



Install “DJI Go 4” app and Firmware.

Install the “DJI Go 4” app onto the mobile device you will be using when flying your drone. This can be downloaded from the Google Play Store or Apple App Stores by searching for DJI Go 4.



DJI Go 4

Open the “DJI Go 4” app and follow the instructions to register and activate your drone with DJI. In the course of this activation process, turn off “Beginner Mode”.



To use DroneDeploy, your drone needs to have the latest version of the DJI firmware installed.

Follow these instructions to make sure you’re on the latest version of the DJI firmware and update if needed: support.dronedeploy.com/docs/firmware-troubleshooting

Set-up Your DroneDeploy Account

Sign up for DroneDeploy at www.dronedeploy.com/signup.html and create your username and password. You can change your plan by navigating to “Settings” from the dashboard.



DroneDeploy

Download the DroneDeploy app from the App Store or Google Play onto the mobile device you will use when flying your drone, and log in with your new account.



2 – Pre-flight Checklist

Register your drone

The FAA requires every new drone to be registered.



Federal Drone Registration

Go to [federaldroneregistration.com](https://www.federaldroneregistration.com) to complete the 5-minute registration form.

Once you receive your registration certificate, clearly mark the registration number on your drone.

Become a Part 107 certified remote pilot

Flying your drone to help you make decisions about your crops is considered a commercial activity, governed by FAA Part 107. This rule requires that commercial operators obtain a remote pilot certificate before flying commercially.

Study for and schedule your remote pilot certification test here: www.catstest.com/airman-testing-exams/uas-knowledge-test.php.

Comply with airspace restrictions

Drones have the potential not only to cause harm to the people and property below them but also to interfere with manned aircraft operations.

Check out [knowbeforeyoufly.org](https://www.knowbeforeyoufly.org) or install the free Airmap app in your DroneDeploy account to make sure you comply with any permanent or temporary flight restrictions in your area. Be safe out there!



AIRMAP

3 – How to Fly

Learn to Fly Manually

Although DroneDeploy automates mapping flights, it's important to have the skills to take over and fly manually if necessary.

Review your DJI Phantom 4 Pro manual and practice flying manually to familiarize yourself with the drone.

Plan Automated Mapping Flights

The DroneDeploy app makes it quick and easy to automatically fly your drone to capture imagery needed for mapping.

To plan your first flight, open the DroneDeploy app and click the "Plan" button.

If you are planning in a location other than your current location, click the magnifying glass icon at the top left of the screen to search for the area you want to map.

To change the area you want to map, either tap and drag the center of the map to move the entire area, or tap and drag the circles on the corners of the flight plan to define the map perimeter.

If you want to add additional points, tap and drag the faint circles on the straight lines.

In the sidebar, you will see adjustment sliders for the altitude and direction of flight. Adjust these as needed based upon the goals of your mission, and save your flight plan.

To change the overlap of each image captured, tap the "Advanced" text at the bottom of the sidebar.

We recommend the following settings for agricultural mapping:

- 400 ft for most crop scouting and large-area mapping (greater than 60 acres. Standard 60% overlap should be sufficient in early stage or highly variable fields, but up to 85% overlap may be required for closed canopy, late-stage fields where the crops are uniform.
- 200-250 ft for maps that will be used for stand analysis and plant counting. If you plan to use an app to generate a report, check the imagery requirements to make sure you capture imagery at an appropriate resolution. Standard 60% overlap should be sufficient, but higher overlap will reduce the likelihood of map stitching failure.

Don't have a good connection out in the field? You can also plan flights on your computer and then sync them to your mobile device for offline flight.

Have a shapefile or KML file defining the field perimeter you want to fly? Install the KML / Shapefile Uploader app and then upload your file when on the flight planning screen.

Figure A. Dashboard

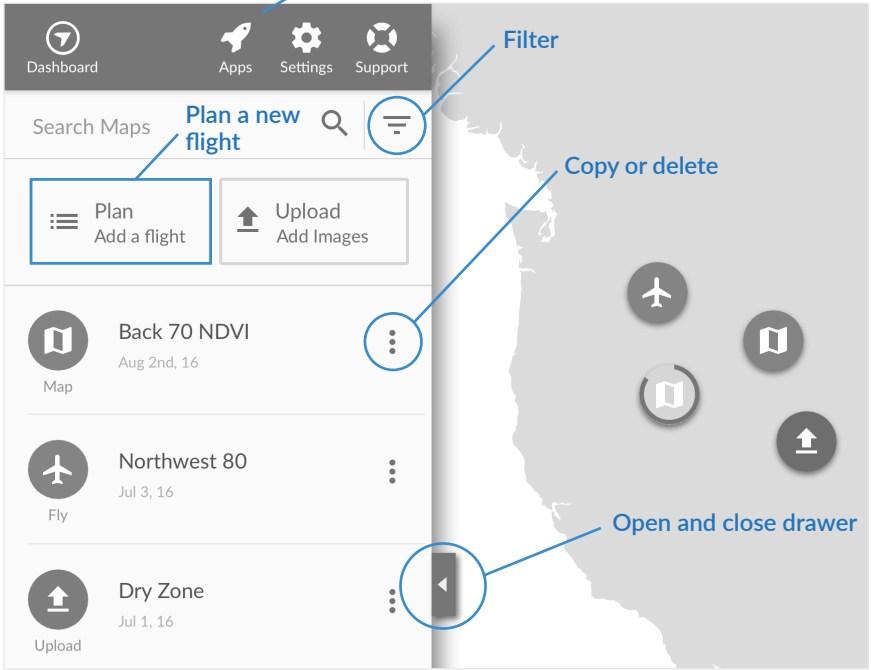
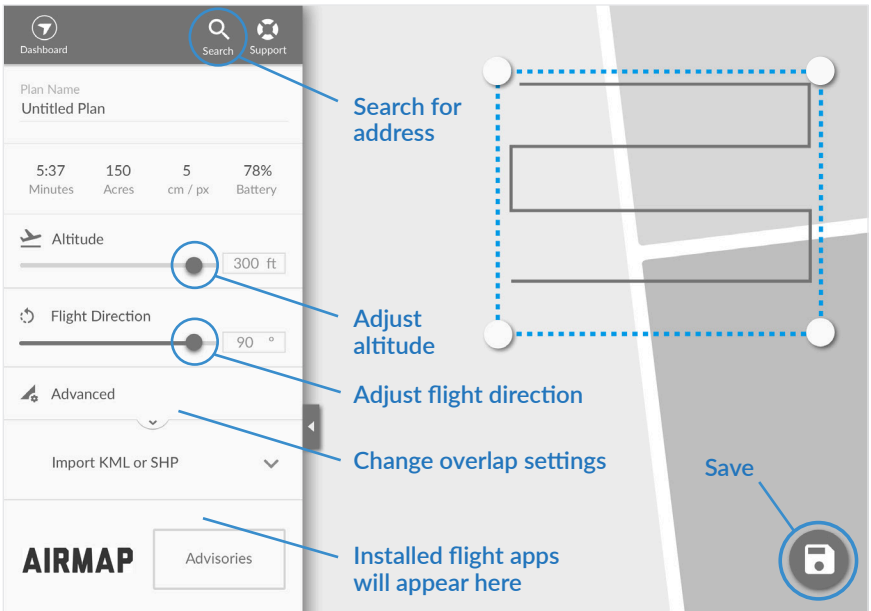


Figure B. Flight Planning



4 – Time to Fly!

Once you have planned your flight, it's time to go out and fly! Follow these checklists to make sure you fly safely and efficiently.

Pre-Departure Checklist

The last thing you want is to get out to the field and realize you've forgotten something important. Use this checklist to make sure everything is ready and you have everything you need before you leave the house.

- Review your flight area on a map for any potential obstacles and to plan your take-off location and battery swap locations (if applicable).
- Provide advance notice to any personnel within the intended flight area that you will be flying.
- If you planned your flight on the computer, open the DroneDeploy app on your mobile device to make sure that your flight plan has synced to your mobile device.
- Check knowbeforeyoufly.org/air-space-map or the Airmap app on the day of your flight to make sure there are no flight restrictions or advisories that apply to your planned flight area.
- Use a weather service to check the forecast. Avoid flying during precipitation. New pilots should not fly in winds >10 mph, experienced pilots should not fly in winds >15 mph.
- DJI Phantom 4 Pro drone and remote control with latest firmware installed
- At least 4 propellers (two with a black stripe and two with a silver stripe).
- Sufficient fully charged batteries to complete your mission (and carrying a spare is usually a good idea).
- Fully charged mobile device with latest version of the DroneDeploy and "DJI Go 4" apps.
- 16 GB Micro SD card with sufficient space to hold mission photos.
- Cable to connect mobile device to remote control (make sure you have the right type of cord for your mobile device).

Onsite Pre-Flight Checklist

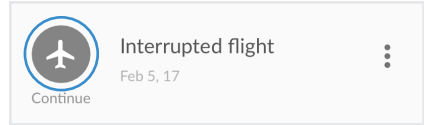
When you arrive at the site, follow these steps:

- Visually inspect the area for any power lines, trees or other obstacles that may interfere with your flight. Verify the location of the sun and try to keep it at your back (you won't be able to see the drone if you're staring into the sun). Also try and keep the wind to your back - if the drone drifts on takeoff, it will drift with the wind. For best results, fly between 10 am - 3 pm, and avoid spotty cloud cover.
- Review your planned take-off and landing location. Ideally, this location should be flat, open and large enough to not require a highly precise landing.
- Review power supply on your mobile device.
- Plug your mobile device into the remote control using the appropriate USB cable.
- Turn on the remote control by pressing the button once until the power lights light up, then pressing the power button a second time and holding it down until all the power lights are lit.
- Open the "DJI Go 4" application on your mobile device and make sure the drone is not in "Beginner Mode".
- Attach the propellers to the drone by matching the black strip with the motors with the three black dots on top, and the propellers with the silver strips to the motors with no black dots on top. Follow the arrows embossed on the propellers and turn them towards the direction of the arrow with the lock on top.
- Make sure the SD card is inserted into the drone.
- Insert the battery into the drone (it only fits one direction) and power it on the same way as you would power on the remote control.
- Make sure that the flight mode toggle is in the "P" position to indicate automatic flight.
- Turn on the drone. The "DJI Go 4" app should recognize that the drone is connected. Make sure there are not any warnings showing on the "DJI Go 4" app, then close the "DJI Go 4" app.
- Open the DroneDeploy app.
- Check for the drone's status in the bottom left of the screen. You should see a green light with the status: "Drone Connected".
- Open your flight plan from the Dashboard.
- Click the airplane icon to initiate pre-flight checks.
- Click the checkmark icon to begin flight. The drone will take off when you tap on the checkmark icon.

During Flight

When the flight begins, the drone will automatically take off, rise to its flight altitude, and then commence flying the flight plan and taking photos.

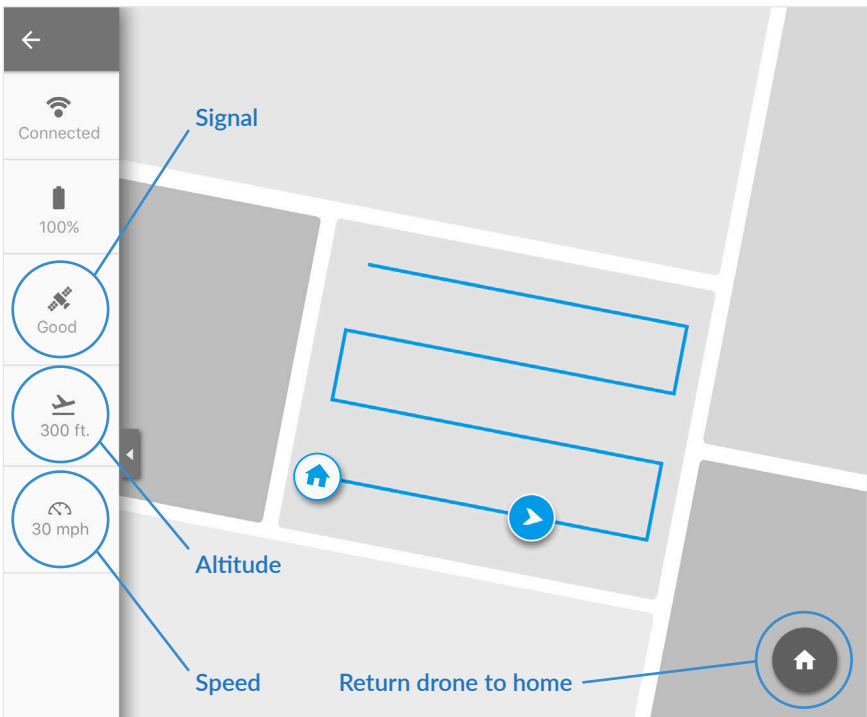
- Maintain visual line of sight with the drone at all times as it flies.
- If a battery swap is needed, click the “Return to Home” button to bring the drone back to its point of take-off. Turn the drone off, swap the battery



and turn it back on. Then, go back to the dashboard in DroneDeploy, find the flight, and click “Continue”.

- You can take manual control of a flight at any time by moving the flight mode toggle to the “S” position.

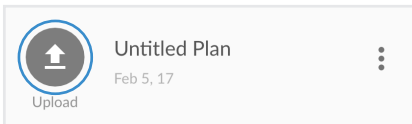
Figure C. Automated Flight



5 – Map Processing and Analysis

Make a Map

- Once your flight is complete, take the Micro SD card out of your drone and put it into your computer (you may need a Micro SD card adapter to do this). Then login to your account on www.dronedeploy.com
- Find your flight plan - the icon should be blue with the text 'Upload' - open the plan to begin the process. and click the upload button.

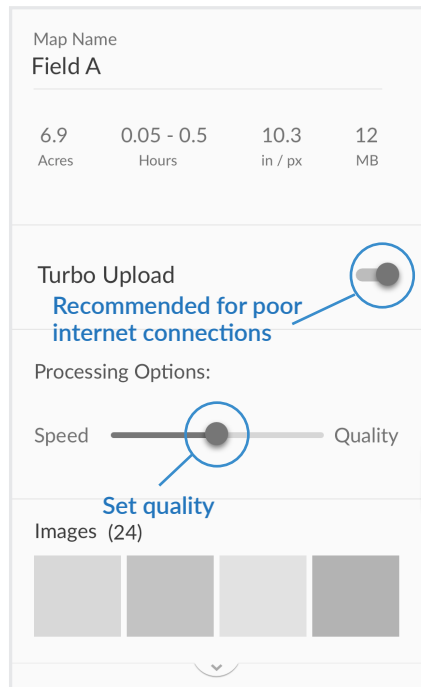


- Keep the Terrain vs Structures button on the "Terrain" setting.
- Click on "Select Photos", and then select all of the photos from your flight on the SD card. Make sure to only include photos taken as part of your mapping flight. Photos of the horizon or of unrelated scenes can confuse the processing software.
- Select your uploading and processing options. For most crop mapping, use the middle processing option, but if you plan to use your map for plant counting, stand counting or measuring volumes, we recommend the highest quality option.
- Leave your computer on, with the DroneDeploy tab open (if you change tabs some web browsers limit the

bandwidth and computer resources for the tab which will cause uploads to fail).

- Once the upload is complete, you may close the tab and shutdown your computer.
- You'll receive an email from DroneDeploy letting you know when your map is complete.

Figure D. Uploading and Processing



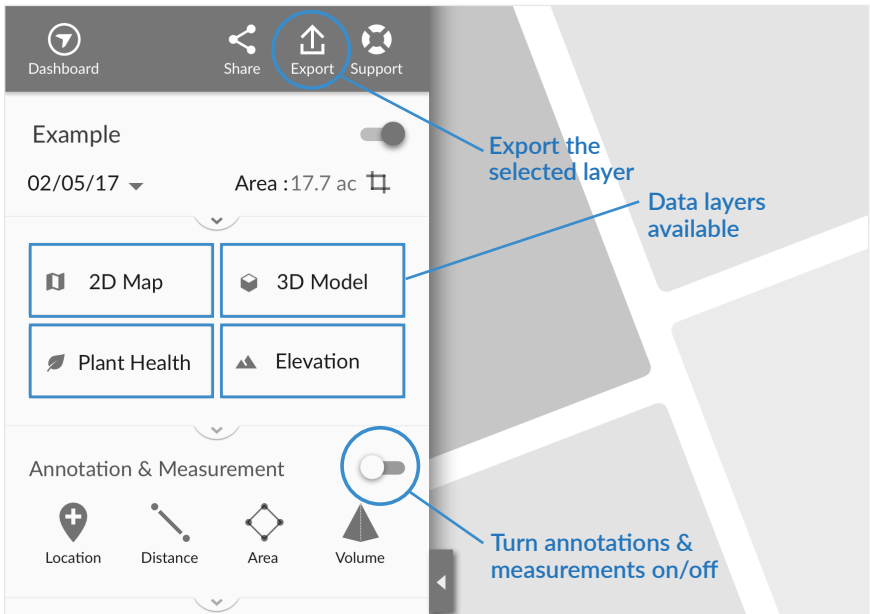
Explore Your Map & Take Action

- Easily apply different plant health algorithms to help highlight variation in crops. We suggest you use the VARI index, an algorithm similar to NDVI, but intended for visual spectrum (Red Green Blue or RGB) imagery. Like NDVI, VARI uses red, yellow and green coloration to highlight areas of poor, medium and strong plant health.
- Use annotations and measurements to mark areas to ground-truth, then take your map out into the field with you to take notes. You can even add photos to your comments!
- Connect other members of your team by sharing your map and comments.
- Want to make prescriptions or estimate damage? Combine plant

health algorithms with management zone and grid tools to measure health and unhealthy acres. Even export a shapefile that can be imported into a Farm Management System and combined with other data such as topography, soil, or historic yield data to make a variable rate prescriptions.

- Export maps in a variety of formats or leverage tools from the App Market to generate specialized reports, including:
 - » Stand analysis
 - » Plant count
 - » Crop damage assessment
 - » Annotations report

Figure E. Explore Your Map on Any Device



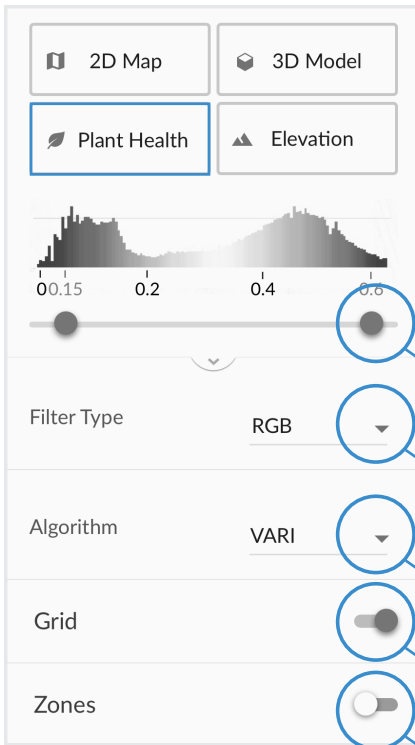


Figure F. Expanded Plant Health Menu

Set slider values

Camera type

Set algorithm - VARI recommended

Turn grid view on/off

Turn zones on/off

Figure G. Grids

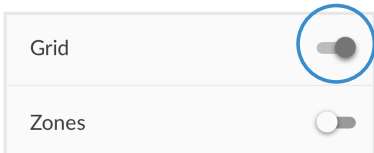


Figure H. Management Zones

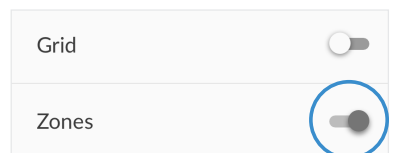
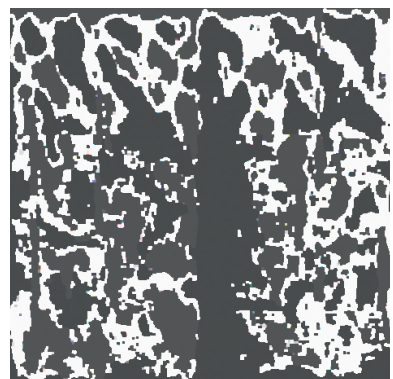
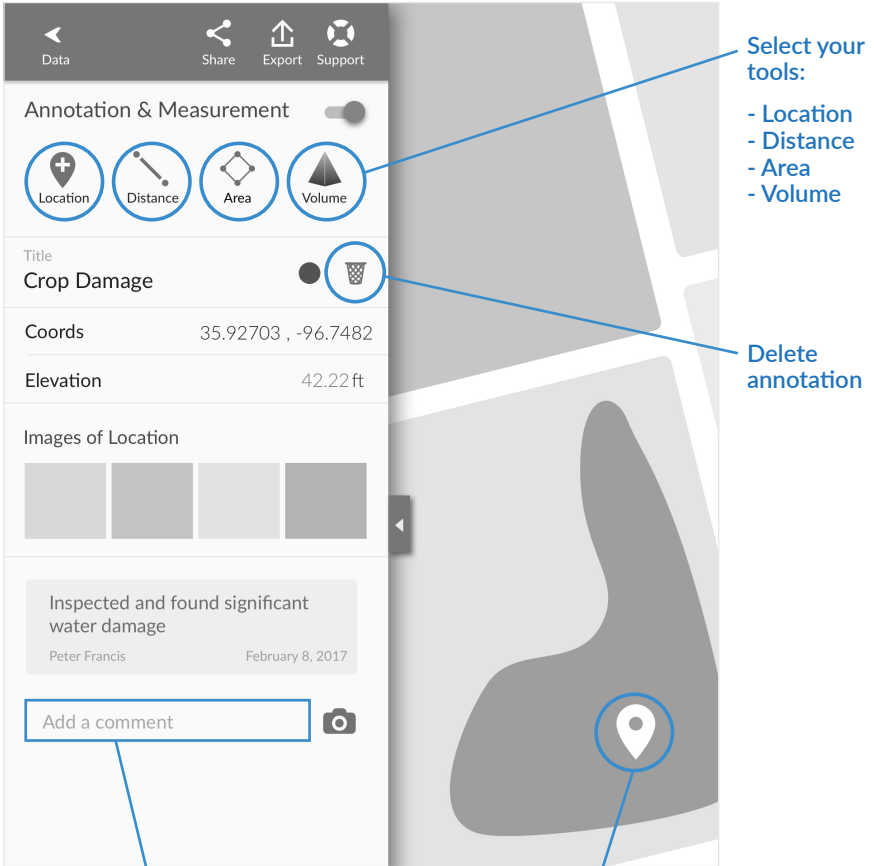


Figure I. Ground-truth and Take Notes



6 – Need Help?

Our Support Team is Here to Help

If you run into any problems, please contact our support team via email or chat, and they will respond to you as quickly as possible.



Chat

Use the chat icon in DroneDeploy to chat with a support representative from 7 am - 7 pm CST, Monday thru Friday.



Email

support@dronedeploy.com

Submit your support questions 24 hours a day, 7 days a week.

Our support team is available to respond to your questions from 7am - 7pm CST, Monday thru Friday.

Prefer to troubleshoot yourself? Check out our troubleshooting guide at <http://support.dronedeploy.com/docs/troubleshooting>.

Where to Learn More

That's it for this guide — so get out there and make your first map! As you gain experience with your drone, don't forget to keep learning. Check out training videos, documentation and support at support.dronedeploy.com.

Happy flying!

The DroneDeploy Team

